

In the Claims:

Please amend claims 1, 4, 8, 11, 18 and 20, and add new claims 21-23 as follows:

1. (Currently Amended) A carbonaceous protective layer having a controlled hardness of at least 18 GPa and a controlled adsorption of a liquid lubricant evaluated from a contact angle to water of not greater than 35° for protecting an underlying material, which is a layer formed by a nitrogen ion beam-assisted Filtered Cathodic Arc process, and contains nitrogen distributed therein, ~~wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.~~

2. (Previously Presented) A carbonaceous protective layer according to claim 1 or 4, wherein a nitrogen content of said carbonaceous protective layer is 2 to 20 at%.

3. (Cancelled)

4. (Currently Amended) A carbonaceous protective layer according to claim 1 ~~having a controlled hardness of at least 18 GPa and a controlled adsorption of a~~

~~liquid lubricant evaluated from a contact angle to water of not greater than 35° for protecting an underlying material, which is a layer formed by a nitrogen ion beam-assisted Filtered Cathodic Arc process, and contains nitrogen distributed therein,~~

wherein nitrogen is not contained in a substantially lower half portion, occupying substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer, and

wherein a nitrogen concentration is gradually increased from substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer to a top surface side in said carbonaceous protective layer.

5-6. (Cancelled)

7. (Previously Presented) A carbonaceous protective layer according to claim 1 or 4, wherein said carbonaceous protective layer is positioned over a magnetic recording layer of the magnetic recording medium.

8. (Currently Amended) A magnetic recording medium comprising a non-magnetic substrate having applied thereon a magnetic recording layer, in which said magnetic recording layer has a carbonaceous protective layer having a controlled hardness of at least 18 GPa and a controlled adsorption of a liquid lubricant evaluated from a contact angle to water of not greater than 35° formed thereon by a nitrogen ion beam-assisted

Filtered Cathodic Arc process, and said carbonaceous protective layer contains nitrogen distributed therein, ~~wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.~~

9. (Previously Presented) A magnetic recording medium according to claim 8 or 11, wherein a nitrogen content of said carbonaceous protective layer is 2 to 20 at%.

10. (Cancelled)

11. (Currently Amended) A magnetic recording medium ~~comprising a non-magnetic substrate having applied thereon a magnetic recording layer, in which said magnetic recording layer has a carbonaceous protective layer having a controlled hardness of at least 18 GPa and a controlled adsorption of a liquid lubricant evaluated from a contact angle to water of not greater than 35° formed thereon by a nitrogen ion beam-assisted Filtered Cathodic Arc process, and said carbonaceous protective layer contains nitrogen distributed therein~~ according to claim 8, wherein nitrogen is substantially not contained in a lower half portion, occupying substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer, and

~~a nitrogen concentration is gradually increased from substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer to a top surface side in said carbonaceous protective layer.~~

12-13. (Cancelled)

14. (Withdrawn) A method of producing a magnetic recording medium comprising a non-magnetic substrate having applied thereon a magnetic recording layer, which has a carbonaceous protective layer deposited thereon, which method comprises the step of depositing said carbonaceous protective layer on said magnetic recording layer by a Filtered Cathodic Arc process, while introducing nitrogen into said carbonaceous protective layer.

15. (Withdrawn) A method of producing a magnetic recording medium according to claim 14, wherein nitrogen is introduced in said carbonaceous protective layer under the conditions that a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.

16. (Withdrawn) A method of producing a magnetic recording medium according to claim 14, wherein nitrogen is introduced in said carbonaceous protective layer under the conditions that nitrogen is substantially not contained in a lower half portion,

occupying substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer.

17. (Withdrawn) A method of producing a magnetic recording medium according to any one of claims 14 to 16, wherein said carbonaceous protective layer is deposited under irradiation of a nitrogen ion beam, or under the application of a nitrogen atmosphere or by combining them together, thereby introducing nitrogen into said carbonaceous protective layer.

18. (Currently Amended) A magnetic disk apparatus comprising a recording head for recording information and a reproducing head for reproducing information to and from a magnetic recording medium, in which said magnetic recording medium comprises a non-magnetic substrate having applied thereon a magnetic recording layer, and said magnetic recording layer has a carbonaceous protective layer having a controlled hardness of at least 18 GPa and a controlled adsorption of a liquid lubricant evaluated from a contact angle to water of not greater than  $35^{\circ}$ , formed thereon by a nitrogen ion beam-assisted Filtered Cathodic Arc process, which contains nitrogen distributed therein; ~~wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.~~

19. (Cancelled)

20. (Currently Amended) A magnetic disk apparatus according to claim 18 ~~comprising a recording head for recording information and a reproducing head for reproducing information to and from a magnetic recording medium, in which said magnetic recording medium comprises a non-magnetic substrate having applied thereon a magnetic recording layer, and said magnetic recording layer has a carbonaceous protective layer having a controlled hardness of at least 18 GPa and a controlled adsorption of a liquid lubricant evaluated from a contact angle to water of not greater than 35°, formed thereon by a nitrogen ion beam-assisted Filtered Cathodic Arc process, which contains nitrogen distributed therein,~~

wherein nitrogen is substantially not contained in a lower half portion, occupying a substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer, and

wherein a nitrogen concentration is gradually increased from substantially one half of the thickness-wise distance from a bottom surface of said carbonaceous protective layer to a top surface side in said carbonaceous protective layer.

21. (New) A magnetic recording medium according to claim 8, wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.

22. (New) A magnetic disk apparatus according to claim 18, wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.

23. (New) A magnetic disk apparatus according to claim 1, wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer, and

wherein nitrogen is distributed in an inclined concentration in said carbonaceous protective layer, and a nitrogen concentration is gradually increased from a bottom surface side to a top surface side in said carbonaceous protective layer.